EPA Desk Statement

June 9, 2017

"Legacy and Emerging Perfluoroalkyl Substances are Important Drinking Water Contaminants in the Cape Fear River Watershed of North Carolina" published in the journal *Environmental Science and Technology Letters*

EPA researchers Andrew Lindstrom and Mark Strynar co-authored an article published in *Environmental Science & Technology Letters* describing a study investigating the occurrence of new types of polyfluoroalkyl substances (PFAS) in surface water and finished drinking water from North Carolina's Cape Fear River. The journal article, titled "*Legacy and Emerging Perfluoroalkyl Substances Are Important Drinking Water Contaminants in the Cape Fear River Watershed of North Carolina,*" was published online on Nov. 10, 2016: http://pubs.acs.org/doi/abs/10.1021/acs.estlett.6b00398.

PFAS have been widely used by industry to make plastics, firefighting foams, and lubricants, and to help make products stain-resistant, waterproof, and nonstick. Newer forms of PFAS have been adopted by industry over the past few years to replace older forms of PFAS compounds that were discontinued by industry, which are called legacy PFAS. Scientists collected water samples in 2013 at Pittsboro, Fayetteville and Wilmington, N.C. drinking water treatment plants. Numerous legacy and replacement PFAS were measured. At the Wilmington facility, researchers measured an average concentration of 631 nanograms per liter of "Gen X," a replacement chemical for PFOA, in source water (raw water) coming into the drinking water plant from the Cape Fear River. PFOS and PFOA were measured below EPA's health advisory level of 70 nanograms per liter. EPA does not currently have health advisory levels for the other PFAS that were measured in this study.

To investigate whether PFAS can be removed from impacted source water, samples from the drinking water treatment plant in Wilmington, N.C. were collected in 2014, at the intake and after each treatment step. Study results found that neither legacy nor replacement PFAS (including Gen X) were effectively removed by the treatment system at this drinking water treatment plant. The researchers then conducted a lab study to see if a powder activated charcoal system could remove PFAS from water samples. This method was successful in removing 80 percent or more of legacy PFAS that had total carbon chain lengths of seven or more, however, it was less effective at removing all other PFAS.

Background:

EPA scientists coauthored this research with scientists from N.C. State University, and staff from the Cape Fear Public Utility Authority, Town of Pittsboro, N.C. and the Fayetteville Public Works Commission. N.C. State scientists collected surface and drinking water samples, and EPA scientists analyzed the samples using high resolution mass spectrometry.

The drinking water treatment plant in Wilmington, NC treats drinking water via coagulation/flocculation/sedimentation, raw and settled water ozonation, biological activated carbon filtration, and disinfection by medium-pressure UV lamps and free chlorine.

The scientists detected other types of PFAS compounds in the Wilmington finished drinking water samples. However, due to the lack of commercially-available chemistry standards for these types of PFAS, the concentrations could not be determined.

The journal voted the paper as one of its four best papers published in 2016

The views expressed in this article are those of the authors and do not reflect EPA views or policy.

For more information about PFAS, see: https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/and-polyfluoroalkyl-substances-pfass-under-tsca

Contacts:

Mark Strynar, Ph.D
Physical Scientist
EPA National Exposure Research Laboratory

Emily Smith
Communications Director
EPA National Exposure Research Laboratory
919-541-5556
smith.emily@epa.gov

Questions & Answers:

Q: What is the difference between polyfluorinated chemicals (PFCs) and polyfluoroalkyl substances (PFAS)?

A: Per- and polyfluorinated compounds, or PFCs, belong to a group of toxic chemicals that include per- and polyfluoroalkyl substances (PFAS), which are a class of man-made chemicals. They are not found naturally in the environment. EPA is now trying to use "PFASs" rather than "PFCs" consistently to describe this group of chemicals. More information can be found at https://www.epa.gov/pfas/what-are-pfcs-and-how-do-they-relate-and-polyfluoroalkyl-substances-pfass.

Q: What are polyfluoroalkyl substances (PFAS) used for?

A: PFAS have been widely used to make products more stain-resistant, waterproof and/or nonstick. For example, PFAS have been used in the manufacture of products that:

- keep food from sticking to cookware,
- make upholstered furniture, carpets and clothing resistant to soil, stains and water,
- make shoes, clothes and mattresses more waterproof,
- keep food packaging from sticking to food, and
- help fight fires at airfields and other places where petroleum-product-based fires are a risk.

Because they help reduce friction, they are also used by a variety of other industries such as aerospace, automotive, construction, and electronics factories or businesses.